

## **CLAIMS:**

1. A breathing circuit limb including:  
an inlet,  
an outlet, and  
an enclosing wall defining a substantially singular exhalation flow passage between said inlet and said outlet, at least a region of said enclosing wall being of a material that allows the passage of water vapour without allowing the passage of liquid water or respiratory gases, and  
a water vapour flow path from said exhalation flow passage to ambient air through said material.
2. A breathing circuit limb as claimed in claim 1 wherein said material is selected from:
  - (a) hydrophilic thermoplastics,
  - (b) perfluorinated polymers
  - (c) woven treated fabrics.
3. A breathing circuit limb as claimed in claim 1 wherein said material is a perfluorinated polymer membrane.
4. A breathing circuit limb as claimed in claim 1 wherein said material is a hydrophilic polyester block copolymer.
5. A breathing circuit limb as claimed in claim 1 wherein said flow passage is a conduit and said region or regions is or are distributed over the length of said conduit.

6. A breathing circuit limb as claimed in claim 5 wherein said region or regions are elongate and run at least a substantial part of the length of said conduit.
7. A breathing circuit limb as claimed in claim 5 including a series of said regions spaced along the length of said conduit.
8. A breathing circuit limb as claimed in claim 5 wherein said conduit including said regions is extruded.
9. A breathing circuit limb as claimed in claim 8 wherein the entire of said extruded conduit is of a material that allows the passage of water vapour without allowing the passage of liquid water or respiratory gases.
10. A breathing circuit limb as claimed in claim 8 wherein said regions of a material that allows the passage of water vapour without allowing the passage of liquid water or respiratory gases are one or more longitudinal strips running the complete length of said conduit.
11. A breathing circuit limb as claimed in claim 5 wherein said conduit includes at least one helically wound polymer tape or strip, part or all of said strip being of a material that allows the passage of water vapour without allowing the passage of liquid water or respiratory gases, respective edges of adjacent turns of said strip being adjoining or overlapping and bonded.
12. A breathing circuit limb as claimed in claim 5 wherein said conduit includes at least one longitudinal strip, part or all of said strip being of a material that allows the passage of water

vapour without allowing the passage of liquid water or respiratory gases, said strip or strips extending parallel to the axis of said conduit, edges of said strip or strips adjoining or overlapping to form an enclosed tube and bonded.

13. A breathing circuit limb as claimed in claim 5 wherein said conduit is a blown film tube of a material that allows the passage of water vapour without allowing the passage of liquid water or respiratory gases.

14. A breathing circuit limb as claimed in any one of claims 10 to 13 including lateral reinforcement against crushing.

15. A breathing circuit limb as claimed in claim 14 wherein said lateral reinforcement includes a plurality of annular corrugations distributed over the length of said conduit.

16. A breathing circuit limb as claimed in claim 14 wherein said lateral reinforcement is a helical bead or a series of annular ring beads or ribs distributed over the length of said conduit.

17. A breathing circuit limb as claimed in claim 11 including lateral reinforcement against crushing wherein said lateral reinforcement is a helical bead disposed over said adjoining or overlapping edges between turns of strip.

18. A breathing circuit limb as claimed in claim 14 wherein said lateral reinforcement is a skeletal reinforcing structure within said conduit.

19. Apparatus for forming a breathing circuit conduit comprising:

a former, onto which a tube wall can be deposited and which advances said deposited tube wall in an advance axis and rotates said deposited tube wall about said advance direction, the speed of said advance and the speed of said rotation together defining a pitch,

at least one film laying head which deposits a film on said former, the combined width of said film deposited by said film laying heads being wider than said pitch such that adjacent turns of laid film overlap to form an overlap seam,

a bead laying head for each said film laying head, each said bead laying head laying a reinforcing bead on an overlap seam,

an axial thread laying head, said thread laying head fitted over and around said former and carrying a plurality of thread feeds, each thread feed allowing the drawing of a thread from a reserve, and

a rotator to rotate said axial thread laying head at substantially the same speed as the expected rotation speed of said tube.

20. Apparatus as claimed in claim 19 wherein, in said advance direction, said bead laying head precedes said thread laying head.

21. Apparatus as claimed in claim 19 wherein, in said advance direction, said bead laying head succeeds said thread laying head.

22. Apparatus as claimed in claim 21 including at least one, but less than the number of said bead laying heads, reinforcement laying head, between said thread laying head and said bead laying head in said advance direction, said reinforcement laying head depositing a mesh tape onto

said former, the combined width of said mesh tapes deposited by said mesh laying heads being greater than said pitch.